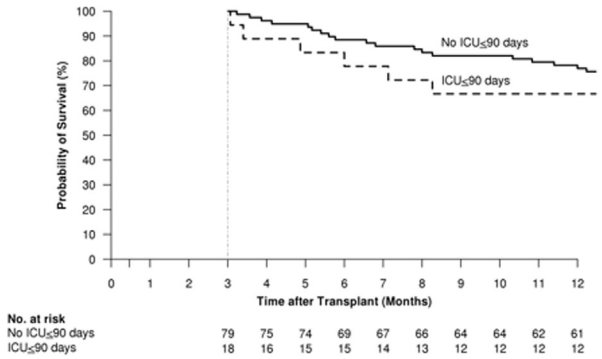

Figure 1. Survival among patients alive at 90 days after transplant according to whether they were admitted to the ICU within 90 days after transplant.

in males is ongoing. Poorer long-term outcomes in ICU survivors warrant validation in a larger cohort and further research to understand its mechanism and develop appropriate strategies. Our study is limited by type II and type I errors due to small sample size and multiple variables. Nonetheless, these results provide potentially important data for patient counseling and may help guide management of critical illness post-transplant.

354

Implementation of Chemotherapy Order and Administration Checklists Ensures Adherence to National Chemotherapy Guidelines

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Background: In 2011, the American Society of Clinical Oncology (ASCO) and the Oncology Nursing Society (ONS) expanded the scope of their 2009 guidelines to address chemotherapy administration safety in the inpatient setting (Jacobson, J., Polovich, M., et al., 2012). The guidelines encompass physician, pharmacy and nursing practices surrounding chemotherapy ordering, processing and delivery. A review of our current processes elucidated opportunity for improvement.

Objectives: To develop and implement processes promoting multidisciplinary congruency with the ASCO/ONS guidelines across our BMT, Hematology and Oncology Inpatient and Ambulatory Care units.

To safeguard administration of chemotherapy.

Interventions: Our initial step involved updating our chemotherapy administration policy for pharmacy and nursing to include recommendations from ONS/ASCO. The policy underwent multiple revisions by nursing, pharmacy and the medical staff prior to approval in July, 2013. Once approved, we developed a checklist for both pharmacy and nursing use to help ensure all required elements were addressed in the order sets prior to processing a chemotherapy order. A separate checklist was created for RN use before and after chemotherapy administration. Finally, we revised the chemotherapy order template for physicians to use in the absence of a pre-printed order set. RN staff, oncology pharmacists and the oncologists were in-serviced on the new policy, order sets and checklists. Beginning in September, 2013, audits were performed on all returned checklists.

Evaluation: In the first months following implementation of the policy, compliance with completion of the checklists was less than 50%. RN champions agreed to audit 100% of the chemotherapy doses ordered and administered. Pharmacy and Nursing compared their orders for the month to ensure there were no missing checklists. Compliance data was shared with the staff on the Oncology/Blood Cancer/BMT Units and individual performance deficits were addressed. Audits of all orders and checklists were continued until greater than 90% compliance was reached. Audits are now done quarterly to monitor continued compliance.

355

Rates of Infection and Pathogen Detection for Patients Undergoing Hematopoietic Stem Cell Transplantation (HSCT)

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With changing immunomodulation, prophylactic and empiric therapy in HSCT patients, continual reassessment of infecting pathogens and rates of recovery are required as infections remain a leading cause of morbidity and mortality. We performed a retrospective chart review of 86 BMT patients who underwent allogeneic HSCT (AlloSCT) or autologous HSCT (ASCT) from 7/11 to 4/14 and with 100 days of post-transplant follow-up. Evaluation included pathogen detection and recovery from D0-30 and D31-100 (defined as one set of testing per 24h period).

There were 86 patients, 30 AlloSCT (median age 35, 20-66) and 56 ASCT (median age 55, 20-72). Age and gender had no statistically significant effect on overall mortality. 100% of patients underwent evaluations for infection. Of 406 total samples obtained, only 22 (5%) revealed a pathogen. 158 (119 D0-30, 39 D31-100) blood culture evaluations were obtained in 66 patients (50 D0-30, 16 D31-100) with only 10 (5 D0-30, 5 D31-100) positive evaluations in 8 patients. Overall, 11% of ASCT and 14% of AlloSCT patients had clinically significant bacteremia. 96 (71 D0-30, 25 D31-100) urine cultures were obtained in 55 patients with 3 (0 D0-30, 3 D31-100) positive evaluations in 2 patients resulting in 0% of ASCT and 7% of AlloSCT with clinically significant bacteriuria. 152 (130 D0-30, 22 D31-100) *C. diff* tests were obtained in 77 patients with 9 positive evaluations in 8 patients (6 D0-30, 2 D31-100) resulting in a *C. diff* detection rate of 12% and 11% in ASCT and AlloSCT patients, respectively. All-cause mortality was 14% (7% ASCT, 27% AlloSCT; $p = 0.021$). Of patients with positive blood, urine, and *C.diff* testing, mortality was 50% ($p = 0.020$), 100% ($p = 0.042$), and 25% (0.003), respectively. No patients died during D0-D100. After D100, infection-related mortality was 25%.

Actionable infections require rapid detection in BMT patients. Clinical parameters often trigger extensive evaluations but our diagnostic yield was $< 15\%$. Infections during D0-D100 were associated with greater all-cause mortality and 25% of post-transplant death was attributed to infection. While current empiric therapy has reduced infection rates, improved clinical algorithms and methods of pathogen detection are needed to improve HSCT care.